Communicable Disease BULLETIN

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New Hampshire Surveillance for West Nile Virus

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In late August of 1999, New York City experienced an outbreak of encephalitis confirmed as infection with West Nile virus. The following information provides a summary of the New Hampshire (NH) surveillance plan as well as general recommendations about reporting and laboratory testing for suspected cases of encephalitis and aseptic meningitis in New Hampshire.

Background

Unlike St. Louis encephalitis (SLE) or eastern equine encephalitis viruses, West Nile virus had never been reported before in the Western hemisphere. West Nile virus is a flavivirus in the same family as St. Louis encephalitis virus.The ELISA antibody test for SLE cross-reacts with West Nile. Both viruses can cause encephalitis, aseptic meningitis and mild febrile illness, but the vast majority of infected persons will be asymptomatic.

The epidemiology and clinical presentation of West Nile virus are similar to SLE. Mosquito-borne viral pathogens cause encephalitis in humans and other mammalian species. Bird species are frequently the animal reservoir for these viruses while mammals, including humans, are accidental hosts. Transmission occurs through the bite of an infected mosquito. Similar to SLE, the primary mosquito vector for West Nile virus is *Culex pipiens,* which is found in New Hampshire. West Nile virus cannot be transmitted directly from person to person or from birds to persons.

The incubation period for West Nile virus illness varies from 5 to 15 days. Most people who are infected are asymptomatic or may experience milder illnesses with fever and headache before fully recovering. Rash, conjunctivitis, lymphadenopathy, hepatitis and pancreatitis have also been reported. In the New York area outbreak, myalgia and weakness were prominent symptoms. In the elderly and persons with immune disorders, West Nile virus can cause more serious neurologic disease and can be fatal.

While New Hampshire has had no reports of meningitis or encephalitis related to arbovirus in the last 10 years, the New Hampshire Department of Health and Human Services (NH DHHS) established a program for mosquito surveillance two years ago, intended to track the presence of eastern equine encephalitis virus in mosquitoes. Traps are located along the seacoast and are monitored from May through September of each year. Viral testing of collected mosquitoes is performed at the Massachusetts Public Health Laboratory. In the two years of the program's existence, no arbovirus has been identified. This testing included West Nile after the virus was detected in New York area during 1999.

While West Nile virus has been detected this year in the New York City area in overwintering mosquito pools and one predatory bird species in Westchester County, NY, it is unclear whether the virus has or will spread to new geographic locations. Further, it is unclear whether there will be any significant northward migration and if northern New England states will experience the public health and animal health implications of this introduction. However, because of the important implications for human and animal health in New Hampshire, it is important to establish a proactive laboratory and ecologic based surveillance program to quickly detect and limit the impact of the virus in New Hampshire.

The NH DHHS has developed a plan in cooperation with many state agencies and private organizations in order to begin to identify issues and build the foundation for mosquito-borne disease prevention, if this becomes necessary. In summary, the plan proposes to improve detection through increased surveillance through 4 methods:

1. **Active mosquito surveillance:** to detect and monitor arboviral activity in mosquito populations and to help identify potential vectors.
2. **Enhance passive avian surveillance:** to detect the presence of and to monitor for West Nile virus activity in wild bird populations.
3. **Enhanced passive veterinary surveillance:** through general alerts, to encourage veterinarians to report neurological illness in animals, with emphasis on horses as a backup system to monitor the extent of West Nile virus transmission outside the bird-mosquito cycle.
4. **Enhanced passive human surveillance:** through general alerts to healthcare providers, hospitals, infection control practitioners and infectious disease specialists, to encourage reports of viral encephalitis and aseptic meningitis in humans.

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Communicable Disease Surveillance in New Hampshire

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Public health surveillance, the continuing and methodical collection, analysis, and dissemination of data, is the basis of public health practice. Surveillance data are critical for planning, implementing, and evaluating public health programs. Applying public health surveillance methods to communicable diseases has enabled public health officials to identify areas for control activities, identify disease clusters and outbreaks, monitor trends in morbidity and mortality, and ultimately design disease prevention activities.

In New Hampshire, the communicable disease surveillance system primarily relies on passively reported data required by state law. New Hampshire state statue RSA 141-C requires health care providers, directors of institutions, members of local boards of health, and laboratorians to report cases and suspect cases of reportable diseases. The current reportable disease list includes 53 communicable diseases and 47 related positive laboratory results.

Both active and enhanced passive surveillance compliment this passive surveillance system. Active surveillance involves the regular solicitation of information. For example, the state Lyme Disease Program requests at scheduled intervals information on suspect cases of Lyme disease from physician participants. Similarly, fifteen sentinel physicians submit weekly information on influenza and influenza-like illness through a yearly influenza surveillance program sponsored by the Centers for Disease Control and Prevention. In the event of an outbreak, public health nurses actively obtain information about cases from facilities and providers. Finally, missed cases of reportable diseases are discovered through medical record reviews and database cross matching. Enhanced passive surveillance involves extensive follow-up of cases to identify new cases of disease among contacts. The state's disease investigation techniques for sexually transmitted diseases and pertussis utilize enhanced passive surveillance.

Through reports and newsletters, Communicable Disease Surveillance (CDS) staff routinely analyze and disseminate data from all components of the communicable disease surveillance system. The biweekly report is an e-mail report with timely, preliminary data on cases reported year-to-date. This newsletter, the Communicable Disease Bulletin, focuses on current communicable disease issues and is mailed to approximately 4,000 individuals statewide. Every year, in-depth analyses on selected diseases are published in the Communicable Disease Annual Report. In addition to producing these regular reports, CDS staff are available to perform aggregate, specialized analyses on request.

Rapid and accurate communicable disease data has proven invaluable to help identify persons at risk for further spread of these diseases and has allowed public health officials to control disease occurrence and outbreaks. The collected data in New Hampshire has enabled public health officials to identify trends in the AIDS epidemic, provide partner notification services for certain sexually transmitted diseases, characterize Lyme disease in the state, and identify community outbreaks of *E. coli* O157:H7. Furthermore, through the surveillance system, public health officials have prevented the further spread of illness by notifying contacts and recommending prophylaxis for diseases such as meningococcal disease, rabies, and hepatitis A. Communicable disease surveillance has detected emerging infectious diseases in the past and may be the first system to identify an influenza pandemic or bioterrrorist event in the future.

Maintaining a useful communicable disease surveillance system requires the cooperation and support of partners. Please help us prevent, control, and monitor communicable diseases in New Hampshire. Report each time you become aware of a person with a reportable communicable disease (see box, next page). You may send your reports by telephone, fax, or mail. During business hours, please call 1-800-852-3345 x 4496 in New Hampshire or (603) 271-4496 to report a communicable disease. Alternatively, you may call the 24-hour, toll free disease reporting hot line at 1-888-836-4971 if more convenient. Reports may be faxed to (603) 271-4933 or mailed to the New Hampshire Bureau of Communicable Disease Control, 6 Hazen Drive, Concord, NH 03301. Reports should include name, age, sex, race, ethnicity, address and occupation of the patient, and the name of the disease with date of onset. HIV reports may include name, but it is not required.

If you are interested in participating in our Lyme disease or influenza sentinel surveillance projects, please call the Bureau of Communicable Disease Surveillance at 1-800-852-3345 x0279 in New Hampshire or (603) 271-0279.

For questions or concerns regarding the reporting of communicable diseases or to

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request copies of our publications, please call the Bureau of Communicable Disease Surveillance at 1-800-852-3345 x0279 in New Hampshire or (603) 271-0279.

Reference

Thacker SB. Surveillance. In: Gregg MB, ed. *Field Epidemiology*. New York: Oxford University Press; 1996.

Reporting Communicable Diseases in New Hampshire

Phone

Bureau of Communicable Disease Control:
(800) 852-3345 ext. 4496 in New Hampshire
or (603) 271-4496

24 hour toll free disease reporting hotline:
(888) 836-4971

Emergency after hours:
(800) 852-3345 ext. 5300

Fax

(603) 271-4933

Mail

Bureau of Communicable Disease Control
6 Hazen Drive
Concord, NH 03301

Reportable Communicable Diseases in New Hampshire

All those diseases labeled with an asterisk (*) should be reported within 24 hours. All others should be reported within 72 hours.

Reportable by Health Care Providers

- Acquired Immune Deficiency Syndrome (AIDS)
- Anthrax*
- Botulism*
- Brucellosis
- Campylobacteriosis
- Chlamydial infection, including chlamydial pelvic inflammatory disease (PID), pneumonia, conjunctivitis, cervicitis, and urethritis
- Cholera*
- Coccidioidomycosis
- Cyclospora infection
- Cryptosporidiosis
- Diphtheria*
- Ehrlichiosis
- Encephalitis, arboviral only*
- *Escherichia coli* O157 infection and other shiga-toxin producing *E. coli*
- Food poisoning*
- Giardiasis
- Gonorrhea, including gonococcal ophthalmia neonatorum, gonoccocal pelvic inflammatory disease (PID), and disseminated gonococcal disease
- *Haemophilus influenzae*, invasive disease*
- Hantavirus pulmonary syndrome*
- Hemolytic uremic syndrome
- Hepatitis, viral: A*, B, E, G
- Hepatitis, viral: positive B surface antigen in a pregnant woman
- Human Immunodeficiency Virus (not name identified)
- Invasive group A/B *Streptococcus* disease
- Legionellosis
- Leprosy, Hansen's disease
- Listeriosis
- Lyme disease
- Malaria
- Measles*
- *Neisseria meningitidis*, invasive disease*
- Mucopurulent cervicitis (MPC)
- Mumps*
- Non-gonococcal urethritis (NGU)
- Pelvic inflammatory disease (PID), unspecified
- Pertussis*
- Plague*
- Pneumocystis pneumonia
- Poliomyelitis*
- Psittacosis
- Rabies in humans or animals*
- Rocky Mountain spotted fever
- Rubella, including congenital rubella syndrome*
- Salmonellosis
- Shigellosis
- Syphilis, including congenital syphilis syndrome
- Tetanus
- Toxic-shock syndrome (TSS) (streptococcal or staphylococcal)
- Trichinosis
- Tuberculosis disease*
- Tuberculosis infection
- Typhoid fever*
- Typhus fever
- Yersiniosis
- Any unusual occurrence or cluster of illness which may pose a threat to the public's health*

Reportable by Laboratories

- *Bacillus anthracis**
- *Bordetella pertussis**
- *Borrelia burgdorferi*
- *Brucella abortus*
- *Campylobacter species*
- Any CD4+ lymphocyte count
- *Chlamydia psittaci*
- *Chlamydia trachomatis*
- *Clostridium botulinum**
- *Clostridium tetani*
- *Coccidioides immitis*
- *Corynebacterium diphtheriae**
- *Cryptosporidium parvum*
- *Cyclospora cayetanensis*
- *Ehrlichia species*
- *Escherichia coli* O157 and other shiga toxin producing *E. coli*
- *Giardia lamblia*
- *Haemophilus influenzae*, sterile site*
- Hantavirus*
- Hepatitis, viral: A*, B, E, G,
- Hepatitis, viral: positive B surface antigen in a pregnant woman
- Human Immunodeficiency Virus (not name identified)
- *Legionella pneumophila*
- *Listeria monocytogenes*
- Mumps*
- *Mycobacterium leprae*
- *Mycobacterium tuberculosis**
- *Neisseria gonorrhoeae*
- *Neisseria meningitidis**, sterile site
- *Plasmodium species*
- *Pneumocystis carinii*
- Polio*
- Rabies*
- *Rickettsia prowazekii*
- *Rickettsia rickettsii*
- Rubella*
- Rubeola*
- *Salmonella species* (*S. typhii* should be reported within 24 hours)
- *Shigella species*
- *Streptococcus* group A/B (*Streptococcus pyogenes/agalactiae*), sterile site
- *Treponema pallidum*
- *Trichinella spiralis*
- Vancomycin Resistant Enterococci (VRE)
- Vancomycin Resistant *Staphylococcus aureus* (VRSA)*
- *Vibrio cholerae**
- *Yersinia enterocolitica*
- *Yersinia pestis**

New Hampshire Department of Health and Human Services
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Concord, NH 03301

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Reporting new onset cases of suspected West Nile-like virus

In order to determine the presence of disease in our state, the NH Bureau of Communicable Disease Control (BCDC) requests that clinicians and hospitals report *immediately* any patients meeting the following case definition with illness onset beginning June 1, 2000 or later:

Case definition

1. Any patient with *viral encephalitis, aged 2 years or older* (Criteria a, b and c below):
   a. Fever ≥ 38.0° C or 100° F, *and*
   b. Altered mental status (altered level of consciousness, agitation, lethargy) and/or other evidence of cortical involvement (e.g., focal neurologic findings, seizures), *and*
   c. CSF pleocytosis with predominant lymphocytes and/or elevated protein and a negative gram stain and culture, *with or without criteria d.*
   d. Muscle weakness (especially flaccid paralysis) confirmed by neurologic exam or by EMG.
2. Any patient aged 2 years or older with *presumptive aseptic meningitis*. This includes symptoms of fever, headache, stiff neck and/or other meningeal signs along with laboratory evidence of CSF pleocytosis with predominant lymphocytes, moderately elevated protein, and a negative gram stain and culture).

All suspect cases should *first* be reported to the NH DHHS by telephone or using the initial standard case report form. BCDC staff will help determine if the clinical presentation meets the case criteria for viral meningo-encephalitis and whether further testing would be appropriate. Our staff will then help facilitate and assure the collection of acute and convalescent sera on all suspected case-patients. The NH Public Health Laboratories will assure that appropriate viral testing for West Nile virus is conducted.

The following specimens are needed for accurate laboratory testing for West Nile virus:

- CSF – Testing by IgM capture ELISA and RT-PCR.
- Sera – Acute and convalescent testing by IgM Capture and IgG ELISA testing.

Patients with milder illnesses (e.g., fever and headache, fever and rash, fever and lymphadenopathy) or no symptoms (e.g., persons with recent mosquito bite but no acute symptoms) do not need to be tested for West Nile virus.

The success of our efforts will be due in large part to the rapid communication and cooperation of the medical and laboratory communities. As always, we appreciate our ongoing partnership with healthcare providers in New Hampshire in reporting and investigating unusual disease manifestations or clusters.

If you have questions please don't hesitate to call us. During business hours (8 am to 4:30 pm) call the Bureau of Communicable Disease Control at (603) 271-4496 or 1-800-852-3345 extension 4496. Nights or weekends call the New Hampshire Hospital switchboard at 1-800-852 - 3345 extension 5300 and request the Public Health Nurse on-call.